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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,943	10/17/2003	Sivakumar Muthuswamy	CM01523LD01	9908

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MOTOROLA, INC  
INTELLECTUAL PROPERTY SECTION  
LAW DEPT  
8000 WEST SUNRISE BLVD  
FT LAUDERDAL, FL 33322

EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/687,943

Applicant(s)

MUTHUSWAMY ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 8 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 8 and 17 recite a current collector interposed between the diffusion layer and a second surface of the MEA. It is unclear if the “second surface” of the MEA is the surface opposite the first surface of the same MEA, and if it is, then there should be a second diffusion layer defined in relation to the second surface. Currently, parent claims 1 and 10 only associate the (one) diffusion layer with the first surface. Correction or clarification is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the

international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 9, 10, 18, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al (U.S. Patent 6,699,611). The reference is directed to a fuel cell comprising a membrane electrode assembly (MEA). A gas-diffusion layer of thermo-responsive polymer is disposed proximate to the MEA, i.e., on a first surface thereof (see col. 4, line 19 et seq). The thermo-responsive polymer may either increase or decrease in porosity in response to an increase or decrease in temperature (see Fig. 4).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

5. Claims 10-12, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 6-267555. The reference is directed to a fuel cell comprising an MEA consisting of an electrolyte membrane and electrocatalysts (see abstract, paragraph 53 of the machine translation). Electrically conductive gas-diffusion layers (12, 13) are disposed on the MEA (see abstract). The gas diffusion layers comprise metal fibers (see paragraph 26), which are inherently PTCE materials. The gas diffusion layers are interposed between

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the MEA and current collectors (see paragraph 76). Since the metal fiber is a PTCE material, the metal fiber layer would inherently be responsive to the temperature of the MEA. Accordingly, the porosity of the metal fiber layer would decrease with increasing temperature, thereby selectively limiting the amount of reactants reaching localized areas of the MEA.

Thus, the instant claims are anticipated.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-267555 in view of Fredley (U.S. Patent 5,998,058).

JP '555 is applied to claims 10-12, 18, and 19 for the reasons stated above.

Regarding claim 15, the metal fibers may comprise a core layer, which core layer may be further coated with metal (see abstract).

JP '555 does not expressly teach that the gas diffusion layer is microporous, as recited in claims 13 and 15.

Fredley is directed to polymer electrolyte fuel cells having electrode support diffusion layers (40, 42) (see Figure 2). In column 6, lines 9-16, the reference teaches that the support layers are made of carbon fiber and have mean pore diameters of about 10-60 microns.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Fredley would motivate the artisan to use a mean pore size of 10-60 microns in the diffusion layers of JP '555, thereby rendering the diffusion layers "microporous." In column 6, line 9, Fredley discloses that the "manufacture of an improved porous support layer 40, 42 of the present invention includes treating a carbon fiber substrate having mean pore diameters and total pore volume appropriate for efficient transfer of fluids in an electrochemical cell such as the described fuel cell 10." Since Fredley identifies pore diameters of 10-60 microns as being suitable, the artisan would be motivated to use this pore size in the diffusion layers of JP '555, thereby rendering the diffusion layers "microporous."

8. Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-267555 in view of Fredley as applied to claims 13-17 above, and further in view of Kim et al.

JP '555 does not expressly teach that the porosity of the gas diffusion material decreases in response to a decrease in temperature (i.e., the material comprises a polymer having positive swelling), as recited in claim 1.

Kim et al. is directed to a fuel cell incorporating a thermoresponsive polymer therein (see abstract). In column 4, line 35, the reference teaches that positive thermoresponsive polymers may be incorporated into a gas diffusion layer.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to incorporate the positive thermoresponsive polymer of Kim et al. into the gas diffusion layer of JP '555. In column 4, line 29, Kim et al. teach that "[a]n added benefit to water management by using a positive thermo-responsive gas diffusion layer is the easier path that the thermo-responsive gas diffusion layer creates by allowing more hydrogen an/or oxygen to come through upon expansion; i.e., diffusion of hydrogen and/or oxygen becomes faster upon increasing use of the fuel cell." Accordingly, the artisan would be motivated to incorporate the positive thermoresponsive polymer of Kim et al. into the gas diffusion layer of JP '555.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the

application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

### ***Double Patenting***

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).



10. Claims 1-17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,743,543. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '543 patent anticipate the instant claims. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993). Note that 35 USC 121 does not prohibit the possibility of a double patenting rejection being made in this divisional application because no restriction was made in the parent application, 09/999,124.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

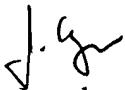
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700.

Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau  
Primary Examiner  
Art Unit 1746  
April 15, 2005